

REMARKS

Claims 1-18 are pending in the present patent application. Claim 1-18 stand rejected; and claims 11 and 14 stand objected to. By this amendment, claims 1, 4, 5, and 14 have been amended, and claims 2 and 3 have been canceled. This application now includes claims 1 and 4-18.

Claims 11 and 14 are objected to on the basis of informalities. In particular, claims 11 and 14 are objected to in that each recites “first velocity,” “when no additional velocity has been disclosed.” Applicants respectfully request the Examiner to withdraw the objection to claims 11 and 14 for the reasons that follow.

Claim 11 is directed to a method of performing printhead maintenance firing in an ink jet printer that has a printhead carrier that carries an ink jet printhead, said ink jet printer having a waste ink receptacle. Claim 11 recites, in part, accelerating said printhead carrier to a first velocity; serializing said print data segments, said timing segment, and said maintenance segment to said printhead; and decelerating said printhead carrier during said maintenance segment.

Since claim 11 recites decelerating the printhead carrier during the maintenance segment, it is clear that the printhead carrier’s velocity must change, since it is known in the art that the deceleration of a printhead carrier will necessarily result in a change to the velocity of the printhead carrier.

Accordingly, an “additional velocity” is inherent in claim 11.

Applicants thus respectfully request that the objection to claim 11 be withdrawn.

Claim 14 is directed to the method of claim 11. Claim 14 recites said printing data segments and said timing segment being serialized to said printhead when said printhead carrier is moving at said first velocity.

In view of Applicants' clarification of claim 11, Applicants respectfully request that the objection to claim 14 be withdrawn.

Claim 9 was rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants' regard as the invention. Specifically, the Examiner requires clarification of the phrase, "print data being printed at said carrier velocity," as recited in claim 9.

As set forth in Applicants' specification,

At step S104, the print data segments (collectively referred to as print data), the timing segment, i.e., timing data, and the maintenance segment, i.e., maintenance data, are retrieved from the memory of ink jet printer 14.

At step S106, and with reference to Figs. 1 and 5, printhead carrier 32 is accelerated during an acceleration ramp 64 to a steady state velocity 66, i.e., velocity (Vc), at which time the print data is printed on the sheet of print media 30.

During steps S104 and S106, the print data segments, timing segment and maintenance segment are retrieved from printer memory and are serialized to the printhead, such as printhead 38b, from the printer memory (See Applicants' specification at page 8, lines 10-18).

Accordingly, based on a reading of the above quote from Applicants' specification, Applicants respectfully submit that it is clear that Applicants' use of the phrase, "print data being printed at said carrier velocity," as recited in claim 9, refers to the fact that serialized print data segments are sent to the printhead at steady state velocity, Vc, which, as is known in the art, results in the printhead, e.g., printhead 38b, ejecting ink in response to the print data while printhead carrier 32, and hence the printhead, are at velocity Vc. Thus the print data is printed at the carrier velocity.

Accordingly, Applicants respectfully submit that claim 9 is definite and does particularly point out and distinctly claim the subject matter which Applicants' regard as the invention.

Accordingly, for at least the reasons set forth above, Applicants believe that claim 9 is in condition for allowance in its present form, and thus respectfully request that the rejection of claim 9 under 35 U.S.C. §112, second paragraph, be withdrawn.

Claims 1, 2, 6, and 7 were rejected under 35 U.S.C. §102(e) as being anticipated by Vega, U.S. Patent No. 6,554,392 B2 (hereinafter, Vega). Applicants respectfully request reconsideration of the rejection of claims 1, 2, 6, and 7 in view of the following.

Vega is directed to managing the spitting of printhead nozzles in an auxiliary spittoon (col. 1, lines 8-10). Vega discloses that spitting may be performed while the printheads are decelerating or accelerating between printing passes (col. 7, lines 33-38).

Applicants believe that claims 1, 2, 6, and 7 patentably define Applicants' invention over Vega, for at least the reasons set forth below.

Claim 1 is directed to a method of performing printhead maintenance firing in an ink jet printer that has a printhead carrier that carries an ink jet printhead, said ink jet printer having a waste ink receptacle. Claim 1 recites, in part, decelerating said printhead carrier from a first velocity after printing print data; and controlling a firing of said printhead during said decelerating in accordance with maintenance data so that ink droplets ejected from said printhead during said decelerating are received by said waste ink receptacle.

Amended claim 1 also recites said maintenance data being appended to said print data for a particular printing swath pass for serialization to said printhead; and wherein a timing segment is interposed between said print data and said maintenance data.

As acknowledged by the Examiner as with respect to the rejection of claim 3, Vega does not disclose, teach, or suggest a timing segment. Accordingly, Vega does not disclose, teach, or suggest a timing segment interposed between the print data and the maintenance data, as recited in claim 1.

Accordingly, for at least the reasons set forth above, Applicants respectfully submit that Vega does not disclose, teach, or suggest the subject matter of claim 1. Accordingly, claim 1, as amended, is believed allowable in its present form.

Claim 2 has been canceled by the present amendment.

Claims 6 and 7 are believed allowable due to their dependence on otherwise allowable base claim 1, as amended. In addition, claims 6 and 7 further and patentably define Applicants' invention over Vega.

For example, claim 7 is directed to the method of claim 6, wherein a length (L) of said waste ink receptacle, which is positioned to begin at a predetermined location, is determined the formula: $L = [(D_{gap} / V_d) \times V_c] + (N / D_{pi})$, wherein: D_{gap} is a gap distance from said printhead to a surface of said waste ink receptacle; V_d is a droplet velocity of ink droplets ejected from said printhead; V_c is a carrier velocity of said printhead carrier; N is the number of spit fires per nozzle; and D_{pi} is the resolution.

Vega simply does not disclose, teach, or suggest that the length of the waste receptacle is determined by the formula $L = [(D_{gap} / V_d) \times V_c] + (N / D_{pi})$, as recited in claim 7, nor does the Examiner assert as much.

Accordingly, claim 7 is believed allowable in its own right.

In addition, Applicants' take note of the Examiner's assertion that the formula recited in claim 7 is "nothing more than the deposition of ink over a given length, similar to ink deposition on a recording medium used in conventional printing."

Applicants disagree with the examiner's characterization of Applicants' invention of claim 7. The cited prior art simply does not disclose, teach, or suggest wherein a length (L) of the waste ink receptacle, which is positioned to begin at a predetermined location, is determined the formula: $L = [(D_{gap} / V_d) \times V_c] + (N / D_{pi})$, as recited in claim 7.

Without regard to the Examiner's assertion, the cited prior art reference simply does not disclose, teach, or suggest the subject matter of claim 7, and accordingly, does not anticipate claim 7.

Accordingly, for at least the reasons set forth above, Applicants respectfully submit that Vega does not disclose, teach, or suggest the subject matter of claims 1, 6, and 7, and thus respectfully request that the rejection of claims 1, 6, and 7 under 35 U.S.C. 102(e) be withdrawn.

Claims 3-5 and 11-16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Vega in view of Fukasawa, et al., U.S. Patent No. 6,830,311 B2 (hereinafter, Fukasawa).

Claim 3 has been canceled by the present amendment.

Applicants respectfully request reconsideration of the rejection of claims 4, 5 and 11-16 in view of the following.

Fukasawa is directed to an ink jet recording apparatus, a moving position control method of a capping device, and is further related to a flushing control method used in an ink jet recording apparatus operated in such a manner that a flushing operation mode is changed in accordance with an adjusting amount of a platen gap (col. 1, lines 8-17). Fukasawa

discloses a flushing control unit for moving the recording head to a flushing area and for applying a drive signal irrespective of a printing operation to the recording head so as to flush ink droplets into the flushing area; wherein: while a flushing operation is carried out in the flushing area, the flushing control unit adjusts an ink jetting amount of one dot during the flushing operation based upon adjustment information of a platen gap adjuster (col. 6, lines 19-22).

Fukasawa discloses that during a printing operation, a flushing timer 71 judges whether or not 10 seconds has passed, and if not, the print path is incremented at step S16, otherwise, a flushing operation is executed at step S20 (col. 16, line 20 to col. 17, line 16, Fig. 7, steps S11-S20).

Applicants believe that claims 4, 5 and 11-16 patentably define Applicants' invention over Vega, for at least the reasons set forth below.

Amended claim 4 is directed to the method of claim 1, further comprising step of calculating the data length of said timing segment based on a length of said print data.

Claim 4 is believed allowable due to its dependence upon otherwise allowable base claim 1.

For example, amended claim 1 recites, in part, said maintenance data being appended to said print data for a particular printing swath pass for serialization to said printhead.

In contrast to maintenance data being appended to the print data for a particular printing swath pass for serialization to the printhead, Fukasawa discloses a parallel timing arrangement, wherein during a printing operation, the Fukasawa control means refers to time count data of the flushing time 71 to judge whether or not 10 seconds have passed.

Accordingly Fukasawa does not disclose, teach, or suggest the subject matter of claim 1, from which amended claim 4 depends.

In addition, in contrast to calculating a data length of a timing segment, as recited in claim 4, Fukasawa discloses judging whether a period of time has passed by referring to time count data (col. 16, lines 41-43). It is well known in the art that judging whether a period of time has passed based on time count data, i.e., the counting of time count data, does not disclose, teach, or suggest calculating a data length of a timing segment, much less within the context of claim 4.

Accordingly, claim 4 is believed allowable in its own right.

Amended claim 5 is directed to the method of claim 1, wherein said timing segment is composed of zeros data.

Claim 5 is believed allowable due to its dependence on otherwise allowable base claim 1 for substantially the same reasons as set forth above with respect to claim 4.

In addition, Fukasawa does not disclose, teach, or suggest a timing segment, much less a timing segment composed of zeros data. Rather, Fukasawa discloses judging whether a period of time has passed by referring to time count data (col. 16, lines 41-43). It is well known in the art that judging whether a period of time has passed by referring to time count data does not disclose, teach, or suggest a timing segment composed of zeros data, since, as is known in the art, a counter accumulates non-zero data bits in order to perform its counting function.

Accordingly, claim 5 is believed allowable in its own right.

Claim 11 is directed to a method of performing printhead maintenance firing in an ink jet printer that has a printhead carrier that carries an ink jet printhead, said ink jet printer having a waste ink receptacle.

Claim 11 recites, in part, serializing said print data segments, said timing segment, and said maintenance segment to said printhead; decelerating said printhead carrier during said maintenance segment; and controlling a firing of said printhead in accordance with data in said maintenance segment so that ink droplets ejected from said printhead during said decelerating are received by said waste ink receptacle.

Applicants respectfully submit that Vega and Fukasawa, taken alone or in combination, do not disclose, teach, or suggest the subject matter of claim 11 for substantially the same reasons as set forth above with respect to claims 1 and 4.

Accordingly, for at least the reasons set forth above, Applicants respectfully submit that Vega and Fukasawa, taken alone or in combination, do not disclose, teach, or suggest the subject matter of claim 11.

Claims 12-16 are believed allowable due to their dependence on otherwise allowable base claim 1, as amended. In addition, claims 12-16 further and patentably define Applicants' invention over Vega.

For example, claim 12 is directed to the method of claim 11, said timing segment being generated by the step of calculating a data length of said timing segment based on a length of said print data segments.

Claim 12 is believed allowable in its own right for substantially the same reasons as set forth above with respect to claim 4.

Claim 13 is directed to the method of claim 11, wherein said timing segment is composed of zeros data.

Claim 13 is believed allowable in its own right for substantially the same reasons as set forth above with respect to claim 5.

Claim 16 is directed to the method of claim 11, wherein a length (L) of said waste ink receptacle, which is positioned to begin at a predetermined location, is determined the formula: $L = [(D_{gap} / V_d) \times V_c] + (N / D_{pi})$, wherein: D_{gap} is a gap distance from said printhead to a surface of said waste ink receptacle; V_d is a droplet velocity of ink droplets ejected from said printhead; V_c is a carrier velocity of said printhead carrier; N is the number of spit fires per nozzle; and D_{pi} is the resolution.

Claim 16 was rejected based on the same rationale as in the rejection of claim 7. Claim 7 is thus believed allowable for substantially the same reasons as set forth above with respect to claim 7.

Accordingly, for at least the reasons set forth above, Applicants respectfully submit that Vega and Fukasawa do not disclose, teach, or suggest the subject matter of claims 4, 5 and 11-16, and thus respectfully request that the rejection of claims 4, 5 and 11-16 under 35 U.S.C. 103(a) be withdrawn.

Claims 8, 10, 17, and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Vega in view of Fukasawa, and in further view of Hamamoto, et al., U.S. Patent No. 6,631,976 B2 (hereinafter, Hamamoto).

Applicants respectfully request reconsideration of the rejection of claims 8, 10, 17, and 18 in view of the following.

Hamamoto is directed to the control of prefire timing, ink ejection power, and pulse width modulation for a print head used with an ink jet printing apparatus (col. 1, lines 8-10). The Hamamoto disclosure includes a Fig. 50, which is a diagram for describing prefire control according to the Hamamoto invention (col. 6, lines 3-4).

Applicants believe that claims 8, 10, 17, and 18 patentably define Applicants' invention over Vega, for at least the reasons set forth below.

Claim 8 is directed to the method of claim 7, said predetermined location being outside a print zone of said ink jet printer, and in relation to an edge of a sheet of print media.

Applicants respectfully submit that Hamamoto does not disclose, teach, or suggest the predetermined location being outside a print zone of said ink jet printer, and in relation to an edge of a sheet of print media.

However, the Examiner asserts that Hamamoto discloses the subject matter of claim 8 in Fig. 50, as being reference character 439 (pre-fire area).

Proportions of features in a drawing are not evidence of actual proportions when drawings are not to scale. When the reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value. MPEP 2125.

Hamamoto does not disclose, teach, or suggest that Fig. 50 is a drawing to scale, but rather, describes Fig. 50 as being a diagram for describing prefire control according to the Hamamoto invention (col. 6, lines 3-4).

Thus, without regard to the appearance of the location of pre-fire area 439 with respect to the Hamamoto ink jet printing apparatus in Hamamoto Fig. 50, Hamamoto does not

disclose, teach, or suggest the predetermined location being outside a print zone of the ink jet printer, and in relation to an edge of a sheet of print media, as recited in claim 8.

Claims 10, 17, and 18 are believed allowable for substantially the same reasons as set forth above with respect to claim 8.

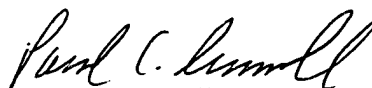
In addition, claims 8, 10, 17, and 18 are believed allowable due to their dependence on their respective base claims 1 and 11.

For the foregoing reasons, Applicants submit that the appended claims are definite and do particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Moreover, Applicants submit that no combination of the cited references teaches, discloses or suggests the subject matter of the appended claims. The appended claims are therefore in condition for allowance, and Applicants respectfully request withdrawal of all rejections and allowance of the claims.

In the event Applicants have overlooked the need for an extension of time, an additional extension of time, payment of fee, or additional payment of fee, Applicants hereby conditionally petition therefor and authorize that any charges be made to Deposit Account No. 20-0095, TAYLOR & AUST, P.C.

Should any question concerning any of the foregoing arise, the Examiner is invited to telephone the undersigned at (317) 894-0801.

Respectfully submitted,



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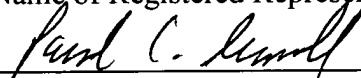
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Name of Registered Representative



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Date